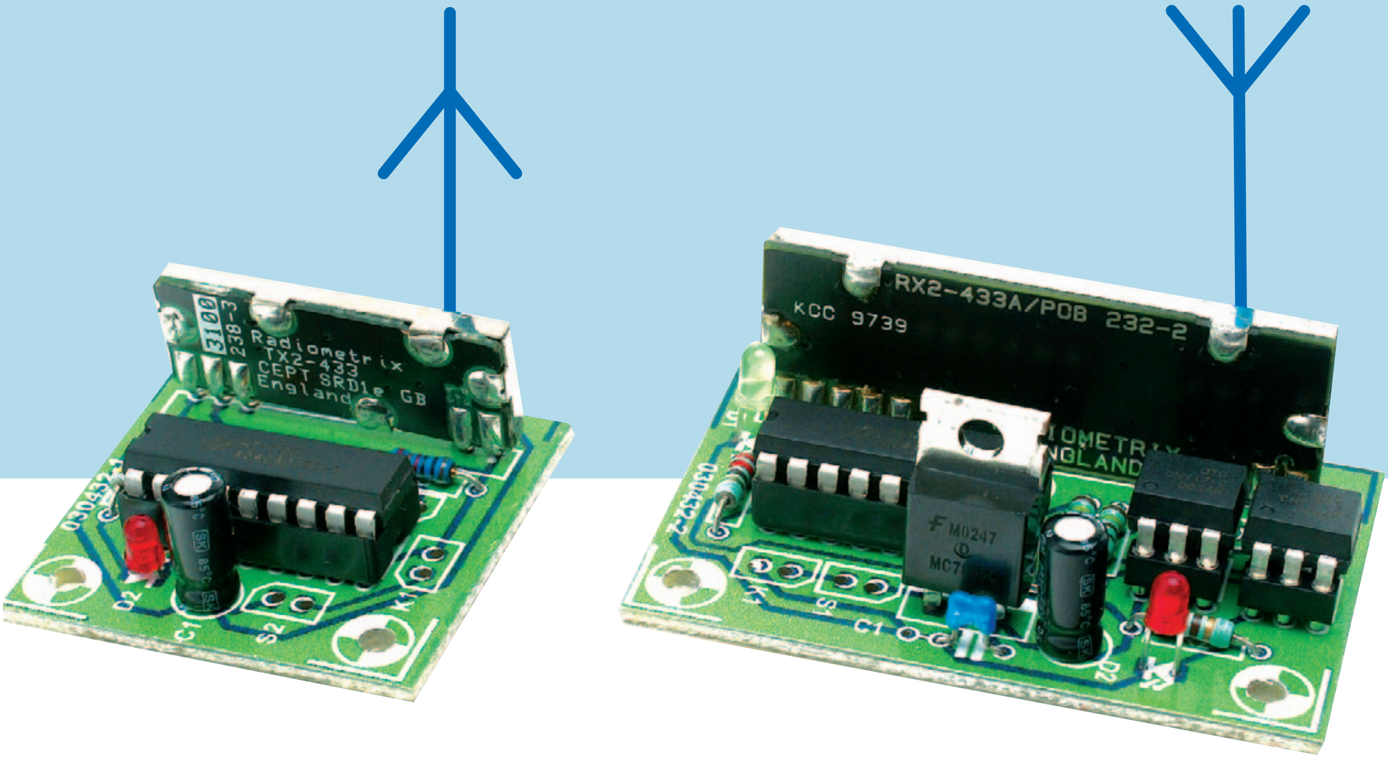

Rajkumar Sharmar

Canon EOS Cameras go Wireless

Using 433-MHz SRD modules

Sure, RF Remote control is desirable if you're into aerial, wildlife, candid or physically dangerous photography, but prepare for a shock if you shop around for commercially available remote controls.

Our homebrew alternative is inexpensive and designed for popular Canon models like the EOS88, EOS66, EOS300D, EOS500N, EOS3 and in fact any other model having a 2.5-mm jack socket for external triggering (find the connection details of the ‘remote control’ socket). Most cameras use the double-action click principle where the first half click is for the aperture measurement and auto-focus, and the second half click for the release shutter.

How it works

The remote control is based on ready-made and type-approved SRD (short-range device) radio modules from Radiometrix, in combination with encoder and decoder ICs from Holtek. The Radiometrix modules and the Holtek IC have been used in a number of previous *Elektor Electronics* projects and probably do not need further detailing except pointers to the datasheets that tell the complete story. The circuit diagram of the **transmitter** in **Figure 1** shows the Radiometrix TX2 module and the Holtek HT12E encoder IC in a classic configuration. The transmitter comes on the air when S2 is closed and is effectively amplitude-modulated by the continuous datastream supplied by the HT12E. The TX2 SRD module is an energy-wise design and therefore ideal for use in portable battery-powered wireless applications. Similar modules are available for other ISM (industrial, scientific, medial) frequency bands like 315 MHz (USA), 418 MHz (UK, now phased out), 433.92 MHz (Europe) and 890 MHz. The HT12E is a serial encoder — its eight addresses inputs A0-A7 allow ‘protection codes’ to be set up. Here, all A(n) pin are connected to ground. A press on pushbutton S1 causes the ‘words’ AD8 and AD9 to be transmitted over the code-protected channel. They can also be transmitted in (time-

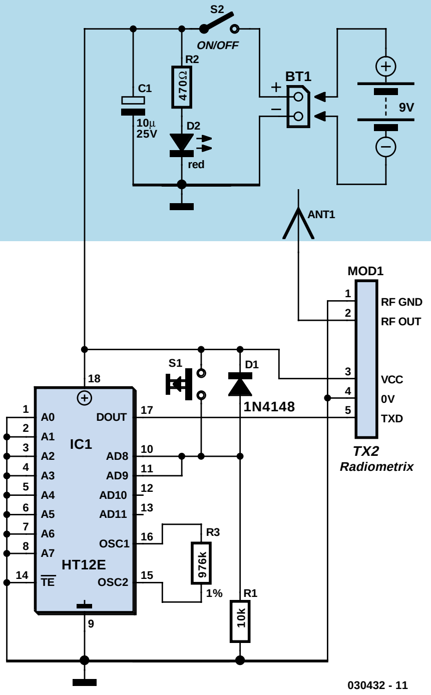

Figure 1. Circuit diagram of the remote control transmitter.

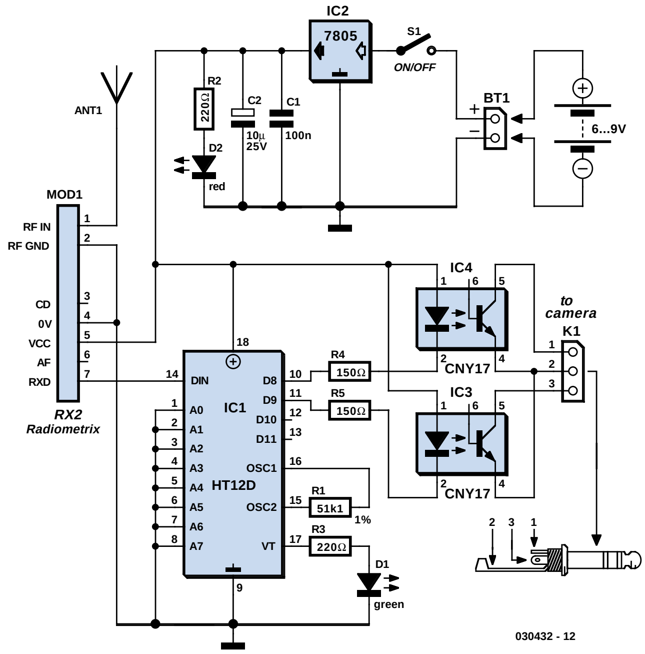

Figure 2. The associated receiver is also an uncluttered design.

COMPONENTS LIST

Transmitter

Resistors:
R1 = 10kΩ
R2 = 470Ω
R3 = 976kΩ 1%

Capacitors:
C1 = 10µF 25V radial

Semiconductors:
D1 = 1N4148
D2 = LED, red
IC1 = HT12E (Holtek) (Maplin Electronics)

Miscellaneous:
ANT1 = stiff wire, length approx. 15.5cm
BT1 = 9V battery connection
MOD1 = TX2 433MHz SRD radio module (Radiometrix). Equivalents from LPRS (www.lprs.co.uk)
S1 = pushbutton, 1 make contact (see also inset)
S2 = on/off switch

Receiver

Resistors:
R1 = 51kΩ1 1%
R2,R3 = 220Ω
R4,R5 = 150Ω

Capacitors:
C1 = 100nF
C2 = 10µF 25V radial

Semiconductors:
D1 = LED, green
D2 = LED, red
IC1 = HT12D (Holtek) (Maplin Electronics)
IC2 = 7805
IC3,IC4 = CNY17-2

Miscellaneous:
ANT1 = stiff wire, length approx. 15.5cm
BT1 = 9V battery connection
K1 = mini jack plug (2.5mm) with 3-wire cable
MOD1 = RX2 433MHz SRD receiver module (Radiometrix)). Equivalents from LPRS (www.lprs.co.uk)
S1 = on/off switch
PCB available from **The PCBShop**

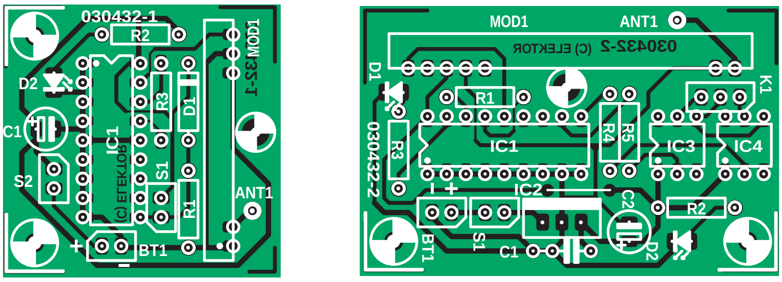

Figure 3. Component mounting plan. The copper track layout may be found on the PCB layouts page towards the back of this issue.

Web pointers

HT12D:
www.holtek.com/pdf/consumer/2_12d.PDF

HT12E:
www.holtek.com/pdf/consumer/2_12e.PDF

TX2 & RX2:
www.radiometrix.co.uk/products/product1.htm

controlled) sequence if you modify the circuit as shown in the inset.

Moving on to **Figure 2** we see that the **receiver** is hardly more complex than the transmitter. Here, the HT12D decoder (IC1) will decode the datastream received from the Radiometrix RX2 module. If the communication is faultless, LED D1 lights and outputs D8 and D9 on the HT12D assume the same digital level as their TX counterparts AD8 and AD9 on the HT12E. Via optocouplers IC4 and IC5 and mini jack plug K1, the camera is then instructed to perform the aperture measurement and then take the picture just as if you'd pressed the relevant button on the camera.

Construction

The transmitter and receiver are built on miniature boards (**Figure 3**) so they can be fitted into compact plastic enclosures. As only regular-size components are used in this project, no problems are envisaged in the construction department. To ensure sufficient range for the remote control, the antennas must, of course, protrude from the cases and be kept well removed from metal objects like a tripod. In practice, you'll find that the usable range of the system will be about 100 m out of doors. Inside buildings, the range will be much smaller.

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Double-action click

Optionally, the circuit may be modified as shown here if you want real double-click operation from your camera (click #1 to perform various settings and click #2 to release the shutter). Although switches S1a and S1b are shown as coupled they are in fact actuated in sequence rather than simultaneously.

A suggested switch of this type is distributed by

Singatron (www.singatron.com/switch/switch/ktl.pdf),

alternatively look at Alps products (www3.alps.co.jp/indexpdf_switches-e.html).